SDMS Document ID
1060091

March 4, 1996

MEMORANDUM

To: Carol Russell

From: Ralph J. Anctil

Re: The Sunnyside Mine, San Juan County, Colorado

Sunnyside Gold Corporation, a wholly-owned subsidiary of Echo Bay Mines, proposes to close the Sunnyside Mine by reclaiming the surface estate and re-establishing a pre-mining equilibrium water level of inflow into the mine workings and outflow of water from the workings by way of natural openings. Continual surface monitoring of these openings and any new ones will be required. SGC proposes to install underground bulkheads in selected areas to stem ground-water flows through man-made openings.

Although certain questions come to mind (such as the effect of flooding the mine would have on adjacent mine workings), the plan to flood the Sunnyside Mine workings is an acceptable opportunity to reduce levels of acid rock (mine) drainage to negligible levels by inhibiting the oxidation of sulfide minerals. Oxygen solubility in water and its normal diffusion rate is very low and is of little concern in terms of acid generation. However, oxidation of sulfides is not entirely halted by a water cover, but its impact is negligible. Of importance is the maintenance of proper water balance to ensure that all potentially acid generating wall rock in the flooded mine, and possibly waste products, will be continuously covered by water. This does not appear to be a large problem at the Sunnyside Mine as only small, scattered amounts of acid-generating minerals exist above the final (proposed) water elevation.

Mine seals usually are designed to hold reasonable heads of water. Sealing problems occur from natural weak spots such as the outcrop and fractures, etc. The mineral and natural rock systems around underground mined areas usually become more permeable due to given rock type and the disturbance caused by mine practices (blasting, e.g.).

The possible disposition in the flooded mine workings of reactive waste products (tailings and waste rock) again offers a promising abatement procedure for reasons stated above. Under-water disposal of these refuse products curtails oxidation to negligible levels. However, physical failure of outcrop areas, among others, will sometimes occur, but more often, the increased water pressures result in seepage through permeable zones, preventing significant water level increases in the mine workings. Unfortuantely, data are seldom available for evaluation of these hydrogeologic characteristics of mined areas,

so judgment because important, as well as trial and error.

Ultimately, the mine owners will have to demonstrate that any water released to the environment will be of acceptable quality, but, in my opinion, this should not be difficult to accomplish.

I concur with this plan for several reasons, the most important of which is that, although it may not be the ultimate solution, it does reduce risks to acceptable and manageable levels, and should problems arise, it will allow time to learn enough to take the next step(s). Technically the plan makes sense and has merit, and I encourage its implementation without further, long-term discussion.